

# Reviewing the New Douglas DC-5

By E. H. Heinemann, Chief Eng. El Segundo Div.

During the summer of 1938, it was realized that there was sufficient demand for a transport airplane of intermediate size, designed basically around passenger safety and economical operation, to warrant the creation of a new model. At that time, requirements of American and foreign airlines were carefully studied, resulting in a decision to build the Model DC-5, a twin engine, high wing, sixteen place transport, with possible alternate arrangements carrying up to 24 passengers.

In order to make deliveries during the summer of 1939, it was necessary to have the prototype ready for flight test not later than February 15, 1939; this date was only six months from the day engineering work commenced but re-

gardless, exactly six months from that date, the DC-5 was ready for flight test. Based on past experience, the prototype DC-5 established a definite production and engineering record.

Using only proven materials, parts and equipment and having parts such as complete engine installations, pilot's seats, cowlings and flight controls interchangeable with those of the Model DC-3, greater economy is now made possible for operators using Douglas equipment. Initial operators of Douglas equipment, of course, will find DC-5 parts readily accessible and considerably standardized as an outcome of past experience on other transport models.

Of primary importance, passenger and crew safety were definitely empha-

sized. The relatively light wing loading, plus the incorporation of the nose-wheel type landing gear, makes the DC-5 unusually capable of safely making "blind" landings and landing under extreme weather conditions, such as cross winds. Take-offs from small areas are also much safer with this type of gear, which has its further advantages in taxiing as well as the elimination of nosing over and ground looping tendencies—all proven by the successful demonstration of the DC-4 model.

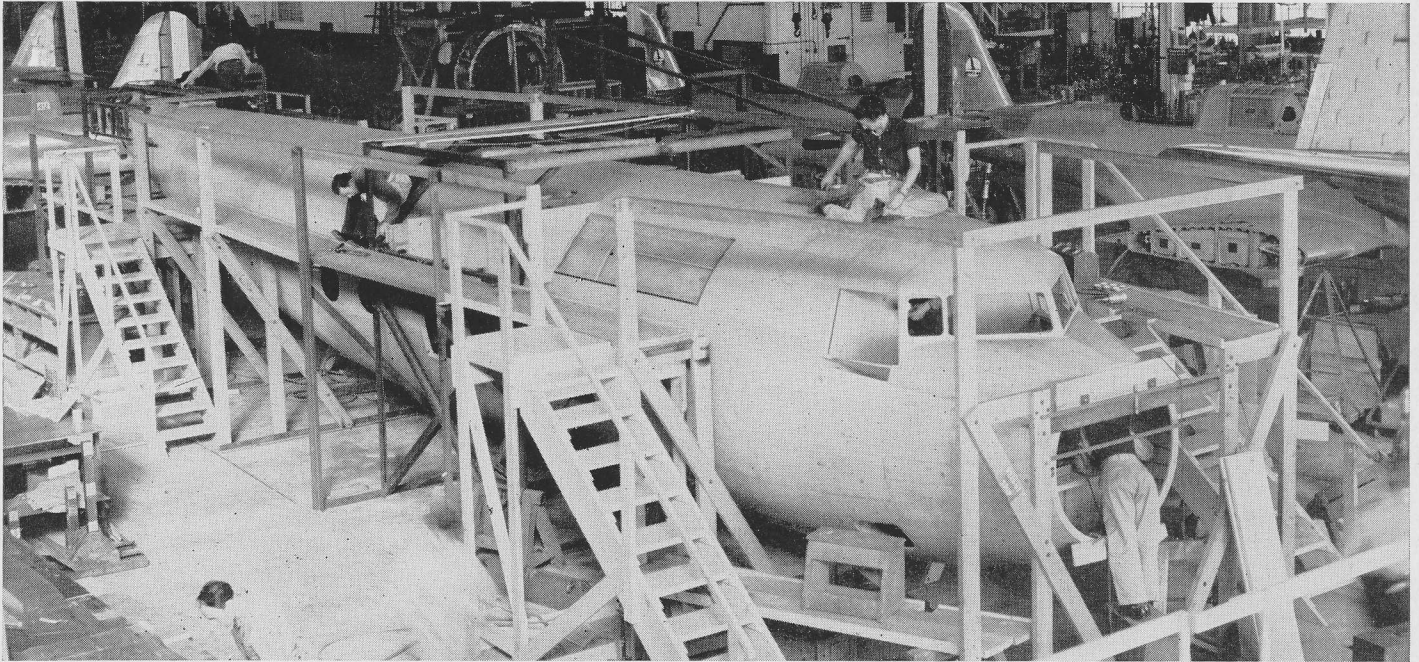
Always a vital point to insure economical and profitable air travel operation, maintenance and service, were naturally given the utmost consideration in designing and constructing the DC-5. Aerodynamic characteristics of the airplane, coupled with the wing and power loading combination, results in the ability to operate at a much lower engine power, which, in turn, affords greater advantage to engine maintenance.

*(Continued on Next Page)*



The picture above shows the C.A.A. Board that inspected the mock-up at the El Segundo Division plant before the DC-5 underwent its tests. With them are officials of the Douglas Company. Left to right: Gordon D. Brown, Douglas Sales; L. J. Hollenbek, C.A.A.; J. A. Moxness, Douglas test pilot; J. L. Kenny, C.A.A.; J. H. Gerteis, C.A.A.; W. M. Cline, C.A.A.; E. R. Doak, Vice-Pres. and general manager of the El Segundo Div.; E. Blount, C.A.A.; J. S. Merriott, C.A.A.; E. H. Heinemann, Chief Eng., El Segundo Div.; S. H. Stevens, C.A.A.; J. A. Leonhardt, asst. project engineer, J. B. Ford, Chief draftsman, El Segundo Div.; L. J. Devlin, project engineer, G. L. Alcorn, C.A.A., and (in the cockpit) J. E. Read, C.A.A.





Passenger vision has been decidedly improved. The high wing feature, combined with the large oval windows, affords exceptionally unobstructed field view, both downward and to the sides. The passengers are protected in the event of emergency landings by a keel built the full length of the fuselage. A thorough consideration of design has resulted in creation of passenger seating arrangement offering the utmost comfort. Scientific soundproofing, individual ash trays, improved reading lamps, individually operated cold air outlets, buffet, lavatory facilities, harmoniously blended interior, etc., all add individual touches to create passenger satisfaction and comfort.

Abundant cargo capacity is provided in two compartments in the forward part of the fuselage between the pilot's cockpit and the passenger cabin. A third unusually large compartment, located aft of the passenger cabin, permits carrying items of uncommon bulk and shape. All cargo can be loaded without the use of ladders or ground handling equipment, contributing toward schedule maintenance. Loading operations are expedited by large doors located close to the ground.

The overall dimensions of the DC-5 are slightly smaller than those of the DC-2 and DC-3 models. The additional passenger accommodations are made possible by the larger fuselage cross section, which also permits concentration of useful load items near the center of gravity.

The structure of the Model DC-5 consists generally of high strength aluminum coated aluminum alloy secured by A17ST rivets.

Transverse frames formed from heavy

Alclad sheet and longitudinal stiffeners make up the major portion of the fuselage framework. The two main frames, to which wing spars attach, are of 24ST dural plate and designed to provide large portals between sections of the cabin. The fuselage is partitioned into several compartments—the pilots compartment in the nose of the airplane, a passage-way connecting the pilot's compartment and passenger cabin, a baggage compartment on the left side of the passage-way and a radio and baggage compartment on the right side of the passage-way, a lavatory next to the radio compartment, the main passenger cabin aft of the lavatory and baggage compartments, a buffet at the rear of the main cabin and another baggage compartment aft of the main cabin.

Three independent units comprise the

landing gear, namely—two main gear units, located beneath the engine nacelles and retractable into the outer wing, and the third, the nose gear, mounted on a single oleo type shock absorber strut and retractable aft into the fuselage.

The DC-5 has hydromatic full-feathering propellers, an independent oil system for each engine, direct hand electric starters, independent fuel systems for each engine with selective cross feeds between engines and tanks; the exhaust collector rings are right and left hand so that, in each case, the hot exhaust gases are kept away from the fuel tanks; space is provided for an automatic pilot; engine nacelles are detachable—these and many other important features are characteristic of the Model DC-5.

To the right is an artist's conception of how the new DC-5's interior will look when completed. The interior trim will not be installed until all flight tests are completed.

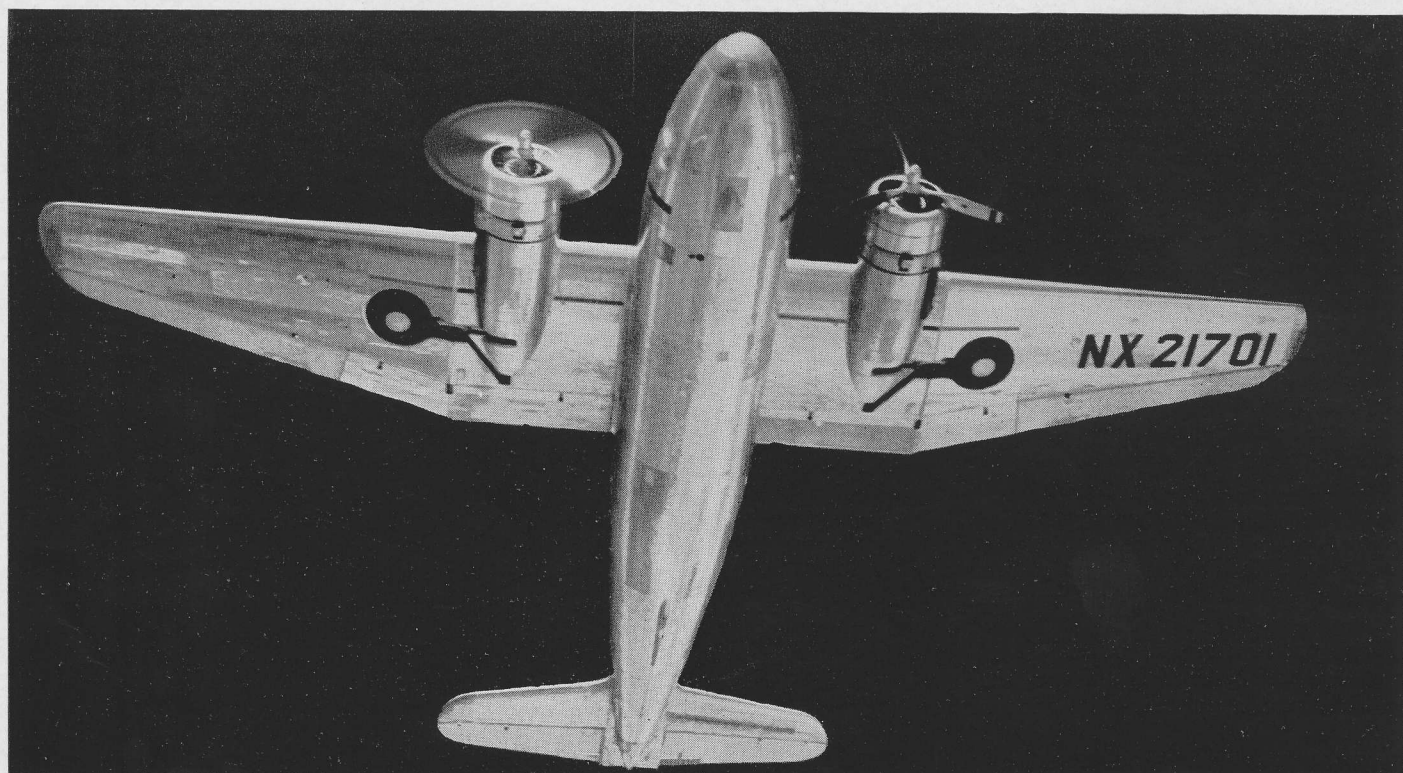




## The New Douglas DC-5 Has Performance!



Above: The new Douglas DC-5 is shown with Santa Monica Bay as a background, after its takeoff from Los Angeles Municipal Airport for single engine climbing test. The DC-5 climbed 250 feet per minute on one engine at 115 miles per hour. In the view below the ship is shown after it passed the photographic ship. It was at 11,500 feet altitude and still climbing when this photo was taken. The first DC-5 is equipped with Wright "Cyclone" GR1820-G2 engines and Hamilton Standard Hydromatic Full Feathering Propellers.





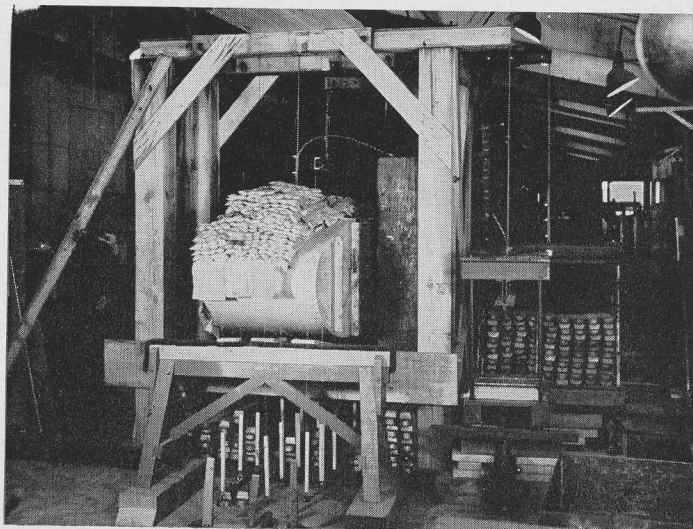
## The DC-5 Accurately Checked Load Conditions Anticipated

The same rigid and careful checks that characterized the static tests of the huge DC-4, have been applied by Douglas engineers of the El Segundo Division to that aerial giant's little sister—the new DC-5.

With every load and operating condition expected in the air or on the ground accurately reproduced in the shop, the DC-5 emerged after weeks of gruelling examination a worthy, full fledged companion to the famous sky-leviathan.

As in the case of the DC-4, the nation's largest and most modern land transport airplane, the DC-5 was subjected to scores of exacting and intricate

" . . . . . tons of lead bars and hydraulic jacks pressed, pulled and bent, . . . . . while delicate instruments recorded . . . . ."



From the raw material to the finished ship, every inch was tested and studied to guarantee the strength, stamina and flexibility of the new DC-5.

tests and engineering studies of its strength, stamina and flexibility.

Tons of lead bars and hydraulic jacks pressed, pulled and bent the wing, fuselage and other components of the craft while delicate, scientific instruments accurately recorded deflections and stresses in figures that proved the new ship as rugged as it is modern.

The DC-5 is an all-metal, twin-engined, high-wing monoplane designed for feeder-line and general utility operations. It incorporates the latest developments in aeronautics—such as the tricycle landing gear—with a nose wheel and the most advanced refinements and aerodynamic improvements of the larger, transcontinental airplanes. Ability to get in and out of small fields is an important characteristic of the ship.

All tests and design problems were carried out under the direction of Ed-

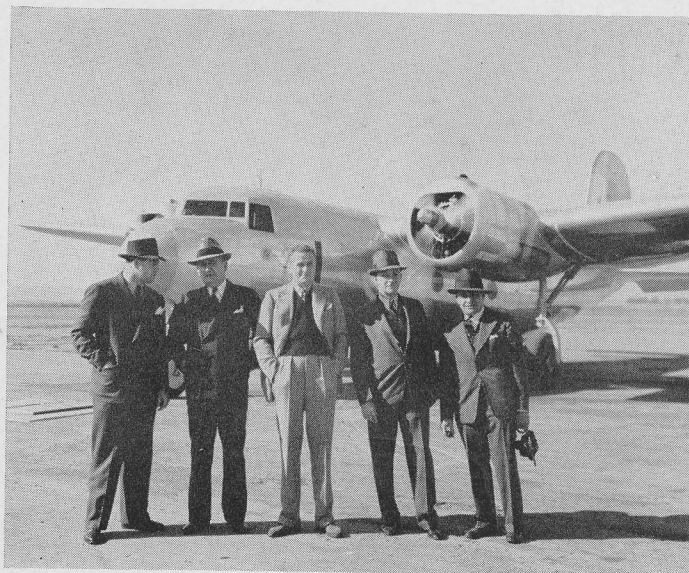
Tests of the new ship were watched by representatives of many of the airlines. Here a group of executives, of T.W.A. Inc., were photographed by H. Jackson with the new DC-5 as a background. Left to right: Jack Frye, President, T. B. Wilson, Chairman of Board, Leland Hayward, Director, F. G. Wilson, Treasurer, Paul Richter, Executive Asst. to Pres.

ward H. Heinemann, Chief Engineer of the El Segundo Division and Edmond R. Doak, its General Manager and Vice-President of the parent organization and Leo J. Devlin, chief designer.

Donald W. Douglas, President, Major Carl A. Cover, Senior Vice-President in charge of Sales, and Chief Engineer Arthur E. Raymond, of the Douglas Company, co-operated in the development of the DC-5.

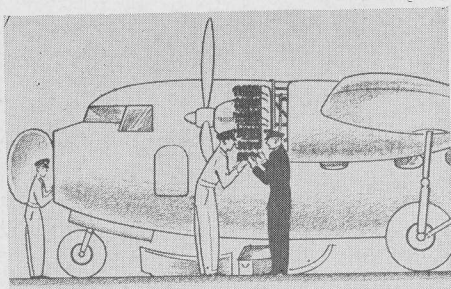
Close supervision over construction and testing of the new plane was exercised by the Flight Test Board and inspectors of the Civil Aeronautics Authority. They checked the methods and figures on static and vibration tests of the ship, and will have charge of the flight tests in the air.

Of great scientific interest is the sturdy beam that runs along the bottom of the center line of the fuselage, which is circular in section. Many parts of the DC-5 are interchangeable with the DC-3, standard equipment of the world's leading airlines.

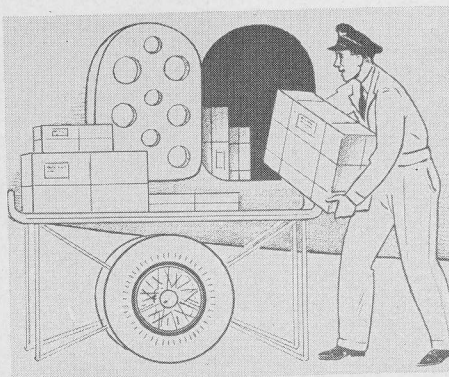




# The DC-5 will be Convenient



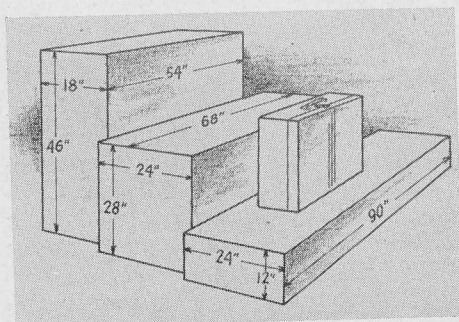
Maintenance ease is exemplified by such items as level position of engines due to tricycle gear and quick access to fuel system strainer from the ground without need for use of a service stand.



Cargo capacity is abundant fore and aft. Holds' extra large dimensions stow consignments of various sizes and shapes. Large doors close to ground simplify and speed unloading operation.

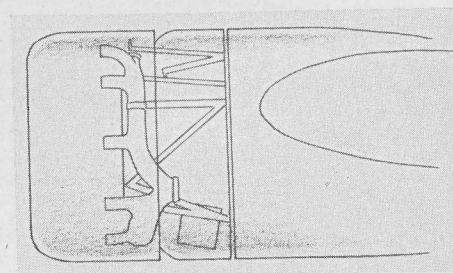


Passenger entry door proximity to the ground facilitates passenger loading. This feature should reflect favorably in scheduled elapsed time from one end of the route to the other.

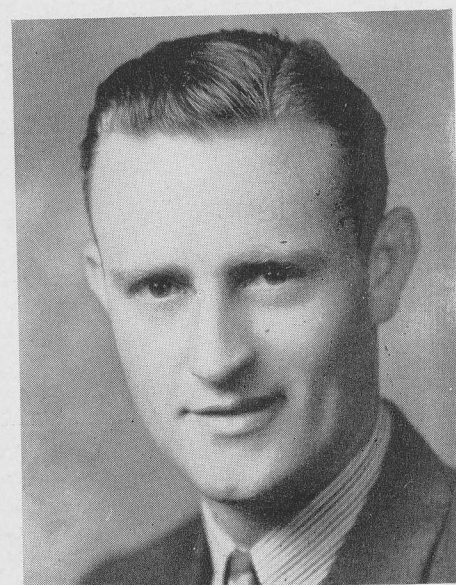


At left are illustrated dimensions of largest size pieces that can be accommodated in cargo holds. Among them is represented outside dimensions of plane's spare tire.

Parts such as engine mounts, control columns, rudder pedals, collector rings, pilot's seats, etc. are DC-2 and DC-3 "service perfected" parts. Added advantage is a reduced investment in spares.



## This Month's Cartoon By Ernie Lawson

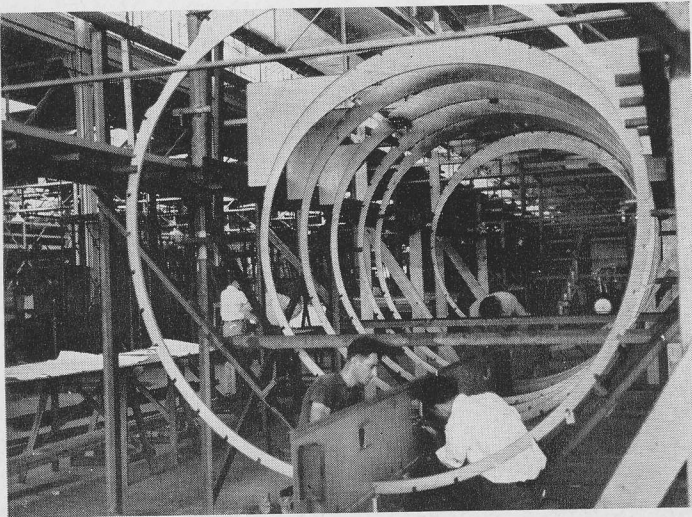


Ernie Lawson, of the El Segundo Division is the newest member of the Airview staff. Ernie is a whiz with a pen and inkpot so you may expect an interesting cartoon every month.

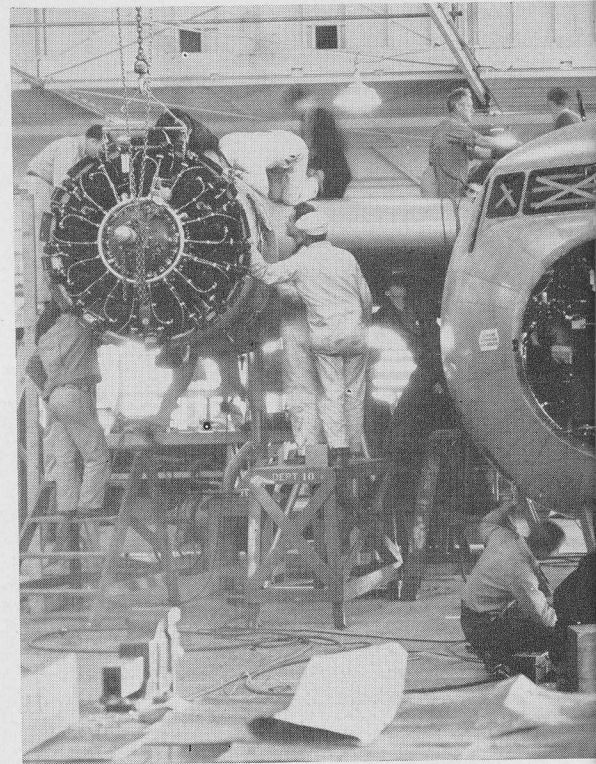




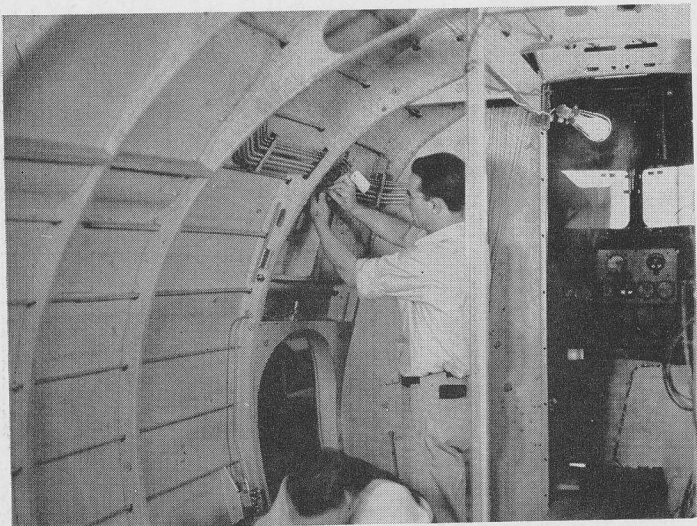
# Experience + Progress Built the Do



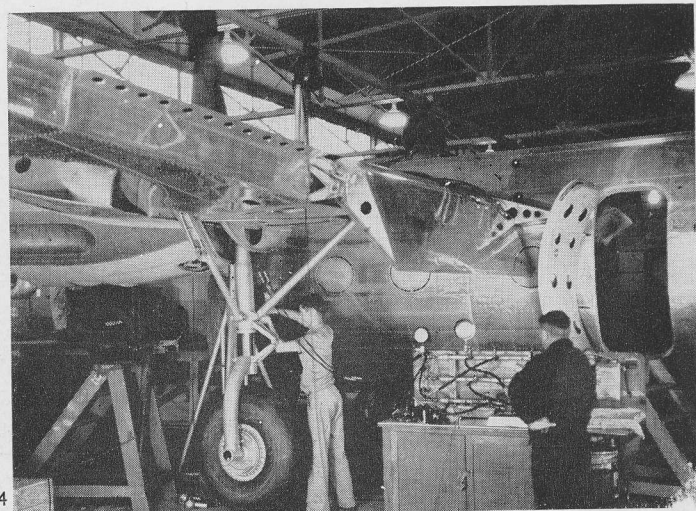
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Above: Final assembly department "putting together" the for the fine workmanship, co-operation and efficiency page, beginning at the top left show: 1. Laying the keel lines. 4. Installation of landing gear. 5. Installation of ment. 7. Putting on the final touches before flight.



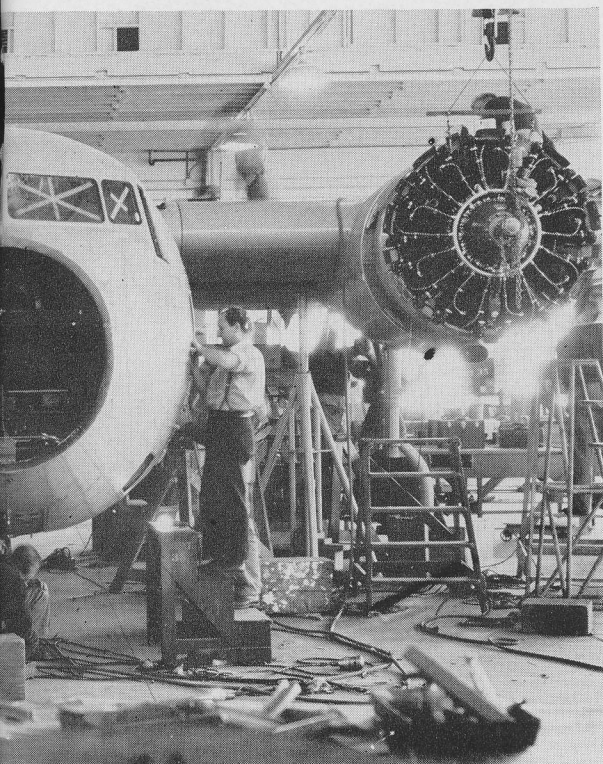
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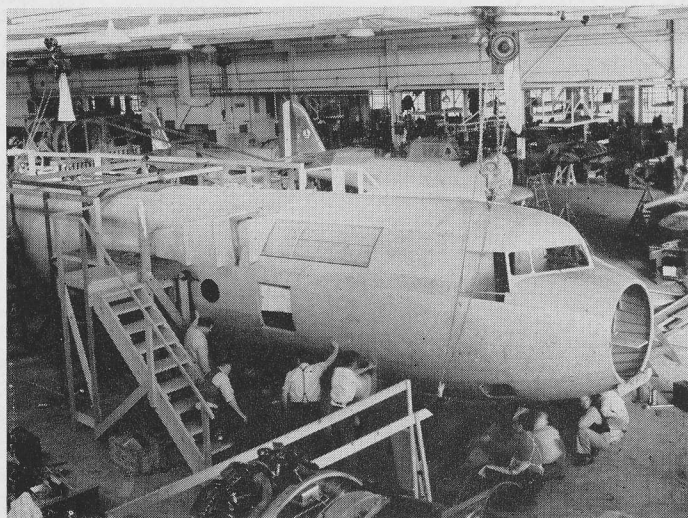
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# El Segundo División Douglas DC-5



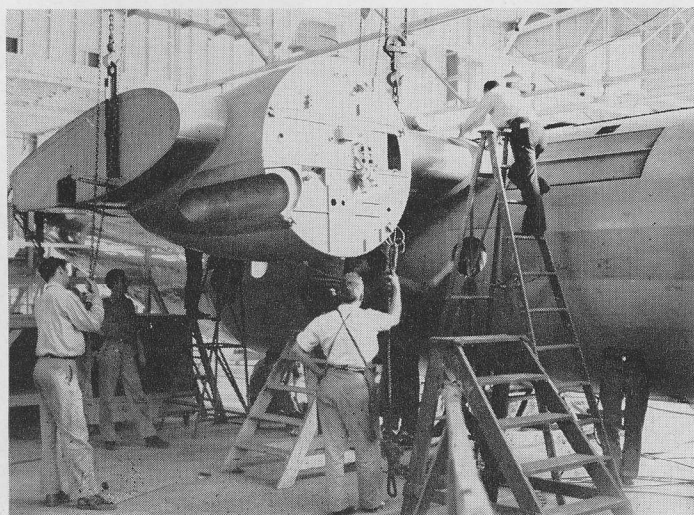
DC-5. El Segundo Division employees are to be congratulated  
down in the construction of the DC-5. The pictures around the  
Inner wing section in assembly jig. 3. Installing the hydraulic  
inner wing. 6. DC5 near completion in final assembly depart-  
8. Fuselage being removed from assembly jig.



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## The DC-5 Takes Off

Another advance in commercial aviation's progress in America was recorded February 20th when the Douglas DC-5 successfully completed its first test flight.

The plane, designed to provide an ultra-modern aircraft for operation in and out of smaller fields, was piloted by Carl Cover, Senior Vice-President. With him at the controls was Jake Moxness. The flight was made at the noon hour in order that it might be witnessed by the employees of the El Segundo Division.

Outstanding innovations in the new addition to the Douglas aerial family are the retractible nose-wheel and the tricycle landing gear, the high wing and the sturdy, sleek fuselage of circular proportions suspended from the wing. The landing gear is similar to that of the world famous DC-4, America's largest and most modern land air transport.

Design specifications call for a top speed of 248 miles per hour, cruising speed of 221 at 75% power and a landing speed of 64 mph. The plane carries 16 passengers and a crew of three. While definite performance figures will have to await official calibrations of instruments, Major Cover said after the flight, which lasted an hour, that the ship fully exceeded all expectations.

Designed to meet requirements of feeder lines and commercial flying over routes now only partly covered by transcontinental airliners, the DC-5 incorporates every advance and advantage of the DC-3 and other super-skyliners, with maneuverability, ease of operations, and economy of small aircraft so desirable for this type of service.

Definite interest in this ship already has been shown by European airlines and by operators of lines and airlines in South America and Africa.

The pictures to the left were taken by Harold Jackson, El Segundo's staff photographer, and graphically show the New Douglas DC-5 taking off on its first flight.

